

V. REMARKS

Claims 1-3, 6, 14, 16 and 17 are rejected under 35 U.S.C. 102(b) as anticipated by Moffat et al. (U.S. Patent No. 6,267,075). The rejection is respectfully traversed.

Moffat discloses a plasma cleaning apparatus that includes a chamber, a magazine, a first electrode, a second electrode, a third electrode, a fourth electrode, a gas inlet and a vacuum outlet. The chamber is adapted for containing a plasma with the chamber having a region between a first wall and a second wall. The magazine is positioned in the chamber for holding one or more items to be cleaned. The magazine includes a first side and a second side between which the item or items to be cleaned will be placed. The magazine is adapted to have a first voltage applied to it. Each of the first side and the second side is rectangular in shape. The first electrode is positioned in the chamber adjacent to the first wall. The first electrode is rectangular in shape. The second electrode is positioned in the chamber between the first electrode and the first side of the magazine. The first electrode is adapted to have a second voltage applied to it and the second electrode is adapted to be electrically grounded. The third electrode is positioned in the chamber adjacent to the second wall. The third electrode is rectangular in shape. The fourth electrode is positioned in the chamber between the third electrode and the second side of the magazine. The third electrode is adapted to have a third voltage applied to it and the fourth electrode is adapted to be electrically grounded. The first voltage, the second voltage and the third voltage all have the same value and are capable of generating plasma. The gas inlet allows a gas which is used to generate the plasma to be introduced into the chamber. The vacuum outlet allows a vacuum to be pulled on the chamber.

Claim 1, as amended, is directed to a plasma cleaning device for cleaning a process target disposed therein with a plasma that includes a chamber, an exhaust mechanism, a process gas introducing mechanism, an active plate electrode, a reflecting plate electrode and an earth plate electrode, a plasma generating power supply and an auxiliary power supply. Claim 1 recites that the exhaust mechanism evacuates the chamber to a reduced pressure therein lower than atmospheric pressure, the process gas introducing mechanism introduces a process gas into the chamber.

Claim 1 also recites that the active plate electrode, the reflecting plate electrode and the earth plate electrode are housed in the chamber and are disposed apart from one another in a facially-opposing, generally parallel manner with the active plate electrode disposed between the earth plate electrode and the reflecting plate electrode. Claim 1 further recites that the earth plate electrode is in an electrically-grounded state and the reflecting plate electrode is in an electrically-floating state with the active plate electrode and the earth plate electrode being disposed apart from one another to define a plasma-producing space therebetween. Additionally, claim 1 recites that the plasma generating power supply is connected to the active plate electrode for supplying a power supply for use in generating the plasma in the plasma-producing space and the auxiliary power supply is connected to the process target by an electrically conductive path connected to the process target from the auxiliary power supply for applying an electric potential to the process target. Also, claim 1 recites that the process target is disposed within the chamber at a disposing position, the disposing position being defined as anywhere within the chamber except inside of the plasma-producing space.

It is respectfully submitted that the rejection is improper because the applied art fails to teach each element of claim 1 as amended. Specifically, it is respectfully submitted that the applied art fails to teach an active plate electrode, an reflecting plate electrode and an earth plate electrode are disposed apart from one another in a facially-opposing, generally parallel manner with the active plate electrode disposed between the earth plate electrode and the reflecting plate electrode. Furthermore, it is respectfully submitted that the applied art fails to teach that a process target is disposed within a chamber at a disposing position with the disposing positioned being defined as anywhere within the chamber except inside of the plasma-producing space. By contrast, Moffat teaches a first grounded electrode is positioned between a first active electrode and a magazine and a second grounded electrode is positioned between a second active electrode and the magazine with a plasma being generated that extends from the first active electrode to the second active electrode. As a result, it is respectfully submitted that claim 1 is allowable over the applied art.

Claims 2, 6, 14, 16 and 17 depend from claim 1 and include all of the features of claim 1. Thus, it is respectfully submitted that the dependent claims are allowable at least for the reason claim 1 is allowable as well as for the features they recite.

Claim 3 is canceled and therefore the rejection as applied thereto is now moot.

Withdrawal of the rejection is respectfully requested.

Claims 4, 5 10-12 are rejected under 35 U.S.C. 103(a) as unpatentable over Maffat in view of Ito et al. (Japanese Unexamined Patent Publication 62-267483). The rejection is respectfully traversed.

JP 483 discloses a plasma treating chamber in which a processing gas is introduced. Electric power is applied on an upper electrode by a high-frequency power source and is conducted to a grounded substrate electrode and a capacitor to generate plasma between the electrodes. The ions formed in the plasma are injected onto the substrate that is placed on the substrate electrode through an insulator sheet to carry out etching.

Claims 4, 5 10-12 depend from claim 1 and include all of the features of claim 1. Thus, it is respectfully submitted that the dependent claims are allowable at least for the reason claim 1 is allowable as well as for the features they recite.

Withdrawal of the rejection is respectfully requested.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as unpatentable over Moffat in view of Godyak (U.S. Patent No: 4,792,727). The rejection is respectfully traversed.

Godyak reveals a system for controlling a gas discharge lamp to provide a positive voltage-current characteristic to permit stable lamp operation without a ballast. The system includes a device coupled to the lamp and defining a first source of power to provide electron heating without in itself providing ionization of the lamp gas and a device also coupled to the lamp and defining a second pulsed source of power having an average output power substantially less than the first source output power to provide ionization of the lamp gas and having a duty cycle substantially less than unity.

Claims 7-9 depend from claim 1 and include all of the features of claim 1. Thus, it is respectfully submitted that the dependent claims are allowable at least for the reason claim 1 is allowable as well as for the features they recite.

Withdrawal of the rejection is respectfully requested.

Claim 13 is rejected under 35 U.S.C. 103(a) as unpatentable over Moffat in view of Li et al. (U.S. Patent No: 6,178,919). The rejection is respectfully traversed.

Li teaches a plasma processing reactor for processing a substrate that includes a chamber, a top electrode, a bottom electrode, an insulating shroud and a perforated plasma confinement ring. The top electrode is configured to be coupled to a first RF power source having a first RF frequency. The bottom electrode is configured to be coupled to a second RF power source having a second RF frequency that is lower than the first RF frequency. The insulating shroud lines an interior of the chamber and is configured to be electrically floating during the processing. The perforated plasma confinement ring surrounds and is disposed outside of an outer periphery of the bottom electrode. Also, the perforated plasma confinement ring is disposed in its entirety at or below a top surface of the substrate. Further, the perforated plasma confinement ring is formed from an electrically conductive material and is electrically grounded during the processing so as to increase ion energy during the processing by removing electrons from the plasma.

Claim 13 depends from claim 1 and includes all of the features of claim 1. Thus, it is respectfully submitted that the dependent claim is allowable at least for the reason claim 1 is allowable as well as for the features it recites.

Withdrawal of the rejection is respectfully requested.

Claims 18-20 are rejected under 35 U.S.C. 103(a) as unpatentable over Moffat in view of Li et al. (U.S. Patent No. 6,835,279). The rejection is respectfully traversed.

Claims 18-20 are canceled and therefore the rejection as applied thereto is now moot.

Claim 15 is rejected under 35 U.S.C. 103(a) as unpatentable over Moffat in view of Japanese Patent 2574852. The rejection is respectfully traversed.

JP 852 discloses a discharge washer that includes a vacuum vessel, a vacuum evacuator, a plasma gas introducing unit, discharge electrodes placed in the vacuum vessel, a single power source that applies voltage upon the discharge electrodes oriented in parallel and variable resistors with each resistor provided in a circuit between the power source in each of the electrodes.

Claim 15 depends from claim 1 and includes all of the features of claim 1. Thus, it is respectfully submitted that the dependent claim is allowable at least for the reason claim 1 is allowable as well as for the features it recites.

Withdrawal of the rejection is respectfully requested.

Further, Applicants assert that there are also reasons other than those set forth above why the pending claims are patentable. Applicants hereby reserve the right to submit those other reasons and to argue for the patentability of claims not explicitly addressed herein in future papers.

In view of the foregoing, reconsideration of the application and allowance of the pending claims are respectfully requested. Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' representative at the telephone number listed below.

Should additional fees be necessary in connection with the filing of this paper or if a Petition for Extension of Time is required for timely acceptance of the same, the Commissioner is hereby authorized to charge Deposit Account No. 18-0013 for any such fees and Applicant(s) hereby petition for such extension of time.

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By:

Respectfully submitted,



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Enclosure(s): Amendment Transmittal

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